

objected to Figures 7(a), 11 and 12(b) as not being identified as "Prior Art". The legend "Prior Art" has been added to those Figures.

The Examiner objected to the specification because of several informalities. These have been corrected by the foregoing amendments.

Claims 2-6 are pending in the application. Claims 3-5 were withdrawn by the Examiner as being drawn to non-elected species, and claims 2 and 6 have been examined on the merits. The Examiner has acknowledged that claim 6 is generic. Claims 2 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cerny et al. (U.S. Patent No. 5,271,563) in view of Beatty et al. (U.S. Patent No. 5,992,768).

The present invention is directed to a fuel injection valve. A rubber ring is provided between a core and a sleeve adapted to seal the fuel valve. In the prior art valves, the pressure change in the valve causes a bounce in the needle that causes an after-dripping effect. The ring allows the after-dripping of the injection to be reduced because it dampens the bouncing of the needle and allows for better combustion.

Cerny et al. is directed to a fuel injector that allows for fine atomization of fuel even at the initiation of the valve opening. The Examiner identifies, in Fig. 2, a solenoid (76), a valve (50), and a sleeve (78). The Examiner identifies the "buffer zone" as "86", although the reference refers to that numeral as an end of the coil (86). Cerny et al. details the use of several O-rings, (64, 100), used to seal the valve, but none that performs the functions required in claim 6. The Examiner also acknowledges that Cerny et al. fails to indicate a "buffer zone" or discuss the issue of needle bounce, but alleges that they are inherent.

Beatty et al. is directed to a fluid seal for high pressures within a fuel injector. This reference discloses the use of an elastic member (130, 230) within a groove (125, 225) to attenuate the pressure seen by the O-ring (24) so that the life of the O-ring may be extended. The reference is silent with respect to the bounce of the needle valve and the pressure caused therefrom.

The above rejection is respectfully traversed. We herewith assert that 1) the Examiner has failed to show that prior art appreciated the problem recited and solved in the claims, 2) the cited references fail to teach or suggest all of the elements of the claims, and 3) the motivation proffered by the Examiner is inadequate to sustain the combination of references.

First, the Examiner has not shown that the problems identified by the Applicant were known in the art. As discussed in In re Nomiya, 184 USPQ 607, 612 (CCPA, 1975),

“It should not be necessary for this court to point out that a patentable invention may lie in the discovery of the source of the problem even though the remedy may be obvious once the source of the problem is identified. This is *part* of the ‘subject matter as a whole’ which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103”.

In the instant application, while the problems that high pressure changes cause in O-rings are discussed in Beatty et al., the problem of “damping a change of fuel pressure caused by the valve bounce when the needle valve is closed” is not disclosed. Additionally, while the occurrence of bounce in a valve could indeed be inherent, knowledge of that bounce and an understanding of the problems that the bounce causes would not be inherent. Thus, the Examiner’s allegation that the issue of needle bounce is inherent in the device is improper and cannot be a basis of a proper rejection of the claims.

Secondly, the references cited in the rejection fail to teach or suggest all of the elements of the claimed invention. Claim 6 recites a “buffer portion” and the Examiner has failed to show that the references teach or suggest such a buffer portion with the function recited in claim 6. While Beatty et al. does teach the use of an elastic member, there is no teaching or suggestion that this acts as a “buffer portion for damping a change in fuel pressure.” The recitation of damping in claim 6 is important because it is through damping that the fuel pressure changes caused by valve bounce are attenuated. At least this element of the claims is neither taught or suggested in the applied references.

Additionally, even if, *arguendo*, the elastic member of Beatty et al. could be thought of as a damping member, the Examiner has not shown that it could function as required by the claims. The Examiner has not shown that the pressures relieved in Beatty et al. are the same or

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Appln. No. 09/413,348

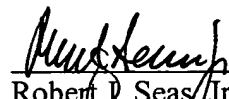
equivalent to those described in claim 6 and that the elastic member could be used to function as required. For at least this reason, the references fail to teach or suggest all of the elements of claims 2 and 6, that the rejections are improper and should be withdrawn.

Lastly, the Examiner alleges that the motivation to combine the cited references would be "to reduce the pressure applied to the seal 100." This motivation would not, however, provide for a buffer portion, as required by claim 6. Claim 6 recites, in part, that the "buffer portion faces and contacts a fuel passage located at an upstream side with respect to an end face of said armature located on a side of a nozzle opening side." Cerny et al. details many different O-rings to seal the valve, and the Examiner has failed to supply any motivation why one of ordinary skill in the art would provide an elastic member where the Examiner has indicated. Thus, the combination of the references would not render obvious the invention of claims 2 and 6 and we request that the rejection be withdrawn.

In view of the foregoing, reconsideration and allowance of this application is now believed to be in order, and such action is hereby solicited.

If any points remain in issue which the Examiner feels may best be resolved through a personal or telephone interview, he or she is kindly requested to contact the undersigned at the local exchange listed below.

Respectfully submitted,

  
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